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# ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

## Series A.
## GENERAL ENTOMOLOGY

World list abbreviation: *Proc. R. ent. Soc. Lond.* (A)

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PROCEEDINGS OF THE
ROYAL ENTOMOLOGICAL SOCIETY
OF LONDON

SERIES A. GENERAL ENTOMOLOGY

VOLUME 14. 1939.

# INSECT PESTS OF RHODODENDRONS: THEIR DISTRIBUTION IN BRITAIN

By G. FOX-WILSON, N.D.H., F.R.E.S., F.L.S.

THE acarine and insect pests of the genus *Rhododendron*, including *Azalea*, in the British Islands have been discussed during recent years (Fox-Wilson, 1, 2, 3), and the present communication is published in the hope that our knowledge of the distribution of the pests of hardy Rhododendrons will be rendered complete through the co-operation of Fellows of the Society.

The " key " pests of the genus in this country comprise the Tingitid, *Stephanitis rhododendri* Horv.; the Aleurodid, *Dialeurodes chittendeni* Laing; certain TORTRICIDAE; and the Curculionids, *Otiorrhynchus sulcatus* (Fab.) and *O. singularis* (L.); and their distribution in the British Isles, together with the type of injury associated with each group, and the susceptibility of Rhododendron Series to attack will be considered.

## *Stephanitis rhododendri* Horv.

This Tingitid has been recognised as a serious pest in England for many years (Johnson, 5), and the presence of rust-coloured leaves indicates the presence of the pest. The upper surface of infested leaves is mottled, and the lower surface is " rusty " or chocolate-spotted, depending upon the method of feeding, which consists of probing the leaf with the stylets, and resulting in the production of a characteristic whitish mottling on the upper epidermis—termed Lesion I. A less common method of feeding, in which no probing occurs, often results in the production of brown spots—termed Lesion II. The characters and histology of these lesions have been investigated by Johnson (6).

The distribution of the pest in Britain as known in 1936 was given by Johnson (5), while the present distribution is herewith illustrated (fig. 1), and comprises 95 individual outbreaks—England, 89; Scotland, 1; Wales, 5; and Ireland, 0. Ecological investigations have so far failed to explain the absence of this species from certain districts, and records show that the Tingitid has failed to colonise either the west coast of Scotland or Ireland, though information is available to show that infested plants have been dispatched to these districts from infested nurseries in Berkshire and Surrey.

The suggestion has been made that this fact is due to the cooler, more humid conditions, with fewer hours of intense sunlight, prevailing in these districts, but definite proof is required. Our knowledge of the habits of this bug indicates that it favours well-lighted positions, and that the southern and western sides of infested plants are preferred to the northern and eastern aspects. It is found that plants growing in shade and in the cool atmosphere of woodland are rarely troubled from attacks of *S. rhododendri*, and attempts to grow certain species and hybrid Rhododendrons in open sunny positions, that is, under conditions other than their natural environment, is liable to result in severe infestations.

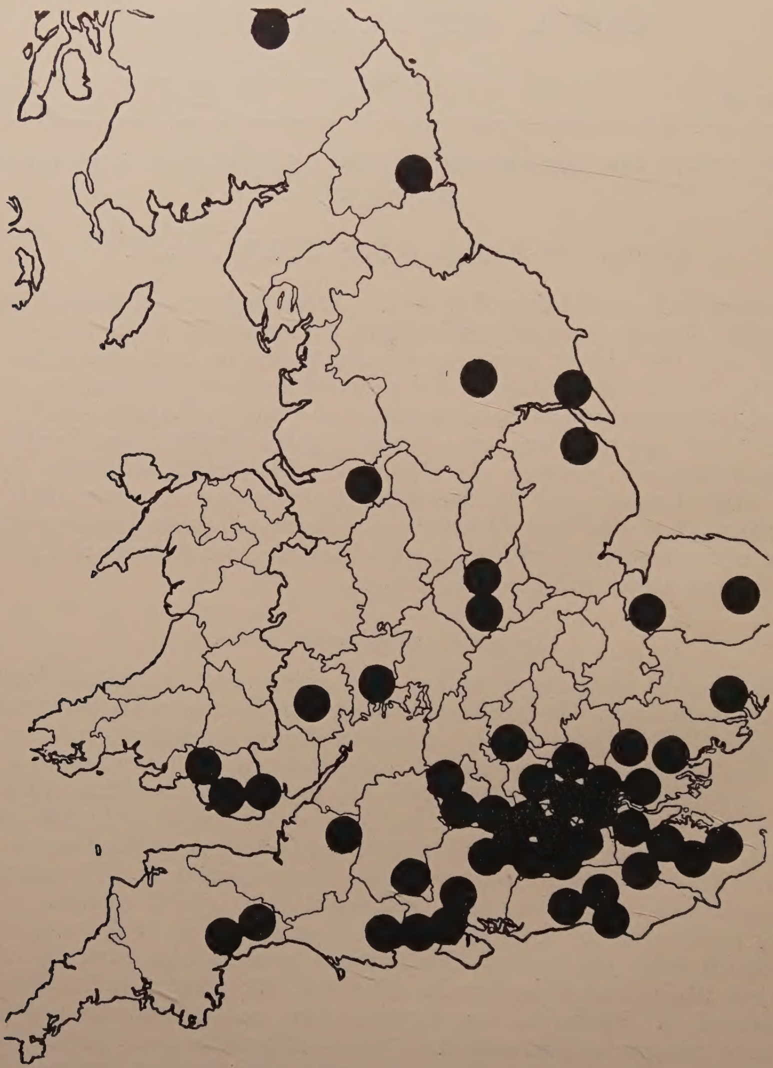

Fig. 1.—Distribution of the Rhododendron Bug, *Stephanitis rhododendri* Horv., in Great Britain.

The following Series of Rhododendron are particularly susceptible to attack, namely, *Arboreum*, *Campanulatum*, *Ponticum* and *Thomsonii*. Other Series, on the other hand, are under natural conditions immune, for instance, *Auriculatum*, *Cinnabarinum*, *Fortunei*, *Lapponicum* and *Triflorum*; and the problem as to the factors affecting the tolerance of species to attack has been discussed by Johnson (6).

### *Dialeurodes chittendeni* Laing.

The Rhododendron White Fly is a comparatively recent pest of hardy Rhododendrons in England (Fox-Wilson, 4), and has more recently been discovered in the United States and in Canada (Latta, 7).

Its presence is generally detected by the growth on the upper surface of the lower leaves of Sooty Moulds, which flourish on the matrix formed by the excessive amount of honeydew excreted by the larvae present on the underside of the distal leaves.

The distribution of this Aleurodid is illustrated (fig. 2), and comprises 25 individual outbreaks—England 25, with no records as yet from Scotland, Wales or Ireland.

The Aleurodid, unlike the Tingitid, is not so markedly heliotropic in its response, and may be found as abundant on Rhododendron hybrids growing in the dense shade of Birch, Oak and Pine woods as on those grown in full sunlight.

The Series *Ponticum*, including hybrids of *Catawbiense*, *Caucasicum* and *Ponticum*, are particularly susceptible to attack, while the *Auriculatum* and *Fortunei* Series are immune.

### Tortricid Moths.

Though the number of Macrolepidopterous species (namely 10) is greater than the Microlepidopterous (namely 7) found attacking the foliage or, in one instance, tunnelling in the shoots (e.g. *Zeuzera pyrina* L.), the greater damage is done by the several species of Tortricids. Some of these moths exhibit a high degree of trophic plasticity, more especially among the Oak-feeding species, and they have adapted themselves to a diet of Rhododendron even in the presence of their normal food plant—*Quercus*.

The larger-leaved Rhododendrons (Group *Elepidote*) prefer shade conditions to full sun, and often form the undergrowth of Oak, Birch and Pine woods, and are thereby rendered more liable to attack by the forest tree-feeding species of Tortricids.

One feature is characteristic of certain species, chiefly *Tortrix viridana* L., namely, that they are not primary pests of Rhododendrons, for their larvae do not feed on the foliage, but utilise the leaves as pupation quarters by rolling them into a tube, with the result that growth is retarded and the plant is rendered unsightly (Fox-Wilson, 3).

The presence both of a thick tomentum and of scales on a Rhododendron leaf tends to render it immune to attack by Hemipterous insects, but the reverse is true so far as Tortricid larvae are concerned, for many such larvae prefer to feed on leaves clothed with a woolly or velvety tomentum, and more especially among the unfolding leaves.

The following Series of Rhododendrons contain species which are particularly susceptible to attack, namely, *Arboreum*, *Falconeri*, *Fortunei*, *Fulvum*, *Lacteum*, *Neriiflorum* and *Taliense*.

### *Otiorrhynchus* Weevils.

The two species of *Otiorrhynchus* which commit considerable havoc to the foliage of hardy Rhododendrons are the Vine weevil, *O. sulcatus* (Fab.), and the Clay-coloured weevil, *O. singularis* (L.) The adults of the former species tend to confine their attacks to the leaf-margins, from which small pieces are removed, producing a scalloped effect. Those of the latter tend to feed on the tissues between the veins and to gnaw partially the mid-ribs and to girdle completely the petioles so that the leaf wilts and frequently snaps off during high winds.

The association between the site of the plants and the attack of these weevils is comparable with that cited for Tortricid moths, and Rhododendrons growing in Birch, Oak and Pine woods are specially liable to infestations.

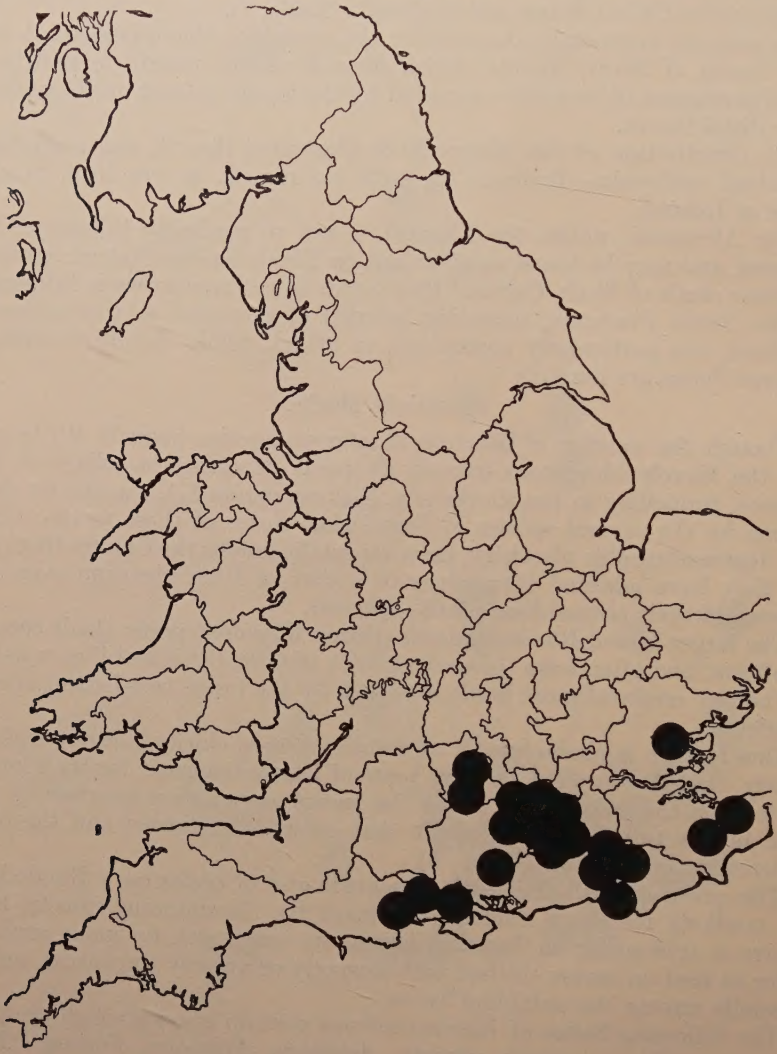

Fig. 2.—Distribution of the Rhododendron White Fly, *Dialeurodes chittendeni* Laing, in Great Britain.

It has been possible to obtain only a few records of the host preferences exhibited by *O. singularis*, and the following list of Rhododendron Series indicates those which are susceptible to attack by *O. sulcatus*, namely, *Arboreum*, *Barbatum*, *Campanulatum*, *Falconeri*, *Fortunei*, *Fulvum*, *Grande*, *Lacteum*, *Neriiflorum*, *Ponticum* and *Taliense*.

## SUMMARY.

The world distribution of the acarine and insect pests of the genus *Rhododendron*, including *Azalea*, has been studied, an account of which will appear in the *Transactions* of the VIIth International Congress of Entomology. The author makes a special appeal to the Fellows of the Society to notify him of the occurrence in the British Islands of the following species, namely, *Stephanitis rhododendri* Horv., *Dialeurodes chittendeni* Laing, and *Graphocephala coccinea* (Forst.), so that a complete record of their distribution will be rendered possible. The " key " pests of hardy Rhododendrons in this country are the Tingitid, the Aleurodid, certain TORTRICIDAE, and *Otiorrhynchus sulcatus* (Fab.) and *O. singularis* (L.), and a short account of these species is given, together with the type of injury associated with each group, and the susceptibility of Rhododendron Series to attack.

## REFERENCES TO LITERATURE.

1. FOX-WILSON, G., 1925, *R. hort. Soc. J.* **50** : 46–54.
2. ——, 1931, *Gardeners' Chronicle* **1931** : 244–245.
3. ——, 1933, *New Flora and Silva* **6** : 36–44.
4. ——, 1935, *R. hort. Soc. J.* **60** : 264–271.
5. JOHNSON, C. G., 1936, *Ann. appl. Biol.* **23** : 342–368.
6. ——,1937, *ibid.* **24** : 342–355.
7. LATTA, Randall, 1937, *U.S. Dep. Agric. Circ.* **429** : 8 pp.

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## BOOK NOTICE.

*Medical Entomology.* A survey of insects and allied forms which affect the health of man and animals. By W. A. RILEY and O. K. JOHANNSEN. 2nd edition. 8vo. New York and London (The McGraw-Hill Publishing Co., Ltd.). 1938. pp. xiii + 483, 1 pl., 184 figs. Price £1 5*s.*

This is the second edition of a book published in 1932, itself a revision of a *Handbook of Medical Entomology* issued 15 years earlier.

It comprises 24 chapters devoted, in the main, each to a class of insects or Arthropods, for Entomology is interpreted in its wider sense and includes the Arachnids and Myriapods.

In each chapter is given details of species of medical importance, reason or cause of their importance, means of combating noxious effects they cause and means of controlling the animals themselves. Information is also given of beneficial results of the activities of Arthropods.

In an Appendix is given information relating to hydrocyanic-acid gas fumigation against household insects.

The original bibliography, extending to 32 pages, is brought up to date by a " Supplementary Bibliography " of 6 pages, but apparently the entry for the reference on p. 121 to Macfie (1922) has not been included. A full index of 19 pages in double column completes the book.

## *LYCAENA DISPAR BATAVUS* OBR. AT WOOD WALTON FEN, 1938 (LEPID.)

By H. M. Edelsten, F.R.E.S.

The colonies of *Lycaena dispar batavus* at both Wood Walton and Wicken Fens suffered rather heavily this spring owing to the inclement weather. The late frosts cut down the young dock leaves just as the larvae had emerged from hibernation, and the ensuing drought delayed the growth of fresh leaves. The larvae consequently were short of food and it is believed some died of starvation. The insect appears to have remarkable powers of resistance and in spite of the adverse conditions sufficient butterflies emerged to produce a good stock of larvae.

## *ENDROMIS VERSICOLORA* (L.) AB. *LAPPONICA* BAU. (LEPID.)

By H. M. Edelsten, F.R.E.S.

This form of *Endromis versicolora* appeared in the second generation of moths raised from Aviemore larvae by Mr. W. E. Dale. The form has not previously been known to occur in Britain but corresponds fairly well with the ab. *lapponica* Bau., which was raised from larvae obtained by Kricheldorff in Swedish Lapland about 1876.

## *CATOPSILIA POMONA* (FAB.) AND *CATOPSILIA CROCALE* (CRAM.) (LEPID.)

By A. Steven Corbet, F.R.E.S.

Entomologists who have studied these butterflies in the field usually incline to the view that there are two distinct species. Both types occur together and it is certainly not an instance of seasonal dimorphism. No difference has been found between the male genitalia of the two forms, but such differences are not always found between allied species of Pieridae.

Although I was unable to induce captive females to oviposit in Malaya, on a number of occasions I bred these *Catopsilia* forms, together with *C. pyranthe* (L.), from larvae which occasionally defoliated a *Cassia* bush in my garden and it has been recorded already (Corbet, 1937, *Proc. R. ent. Soc. Lond.* (B) **6** : 50) how three large broods of larvae from this bush in 1930 produced only *C. crocale*, although small numbers of larvae collected from this bush and elsewhere occasionally produced all three species.

On 12.xii.1936 in Singapore, Mr. C. F. Cowan found a male *C. pomona in copula* with a female *C. crocale*, and took a pair in the reverse cross in the same locality on 30.xii.1937. Mr. Cowan is a very accurate and competent entomologist who appreciates the issue involved, and I think that the possibility of a mistake can be entirely ruled out.

In spite of these observations, however, it appears desirable that breeding experiments from ova should be conducted before conspecificity is finally accepted. My experiments indicated that, if these two forms constitute a single species, *C. crocale* is almost certainly the dominant form, so that pairings involving both sexes of *C. pomona* are most likely to lead to conclusive results.

# A NOTE ON THE PUPA OF *ANDRENOSOMA ALBOPILOSUM* VILLN. (DIPTERA : ASILIDAE)

By H. Oldroyd, B.A., F.R.E.S.

(*British Museum* (*Natural History*)).

*A. albopilosum* was described by Villeneuve (1911 : 310) from a single female in the Paris Museum, taken by M. Bénard on 16th June, 1910, on the Campo dell'Oro near Ajaccio, Corsica; M. Séguy informs me this is the only specimen known to him.

On 8th August, 1938, while we were collecting in this locality, my friend Mr. C. R. Ribbands drew my attention to a log lying on the beach, from which projected a number of empty pupal exuviae, and around which the adults of *A. albopilosum* were abundant. Unfortunately the log was old and dry, and quite without bark, and I was unable to identify it. The galleries opened on the side of the log, and extended some distance into the wood. I was able to obtain a series of both sexes of the adults, and several well-preserved exuviae.

The male imago is precisely like the female, except that the lateral abdominal spines are stouter, and, being black, more conspicuous. The male terminalia are very similar in external appearance to those of *A. atrum*, and since, as Villeneuve remarks, the species is abundantly characterised by its entirely black colour and white pilosity, I have not ventured to give a detailed description of the hypopygium.

I have since discovered in the British Museum a series of four males and four females taken in the same locality by F. Guglielmi on 25 July and 20 August, 1906.

Melin (1923 : 181–182) has commented on the existing descriptions of the pupa of *A. atrum*, and here one need only draw attention to those generic characters which Melin regarded as being still in doubt.

There is one pair of anterior antennal processes, rather slender towards the tip, with no trace of a bristle at the base in any of the specimens before me. The posterior processes are stout, three-toothed, with sometimes a trace of a rudimentary fourth tooth; the base of the process is distinctly corrugated. Four lower facial processes, the outer ones simple, the inner ones bifid, with a tiny bristle on the upper surface. Mouth-parts as figured (fig. 1, b).

At the base of the leg-sheaths a very lightly sclerotised ridge represents the toothed swelling present in species of *Laphria*, whereas the swelling at the wing-base, though little sclerotised, bears a distinct blunt, tooth-like process.

The short rows of bristles on the pleura are weaker and less conspicuous than in *Laphria*. The last abdominal segment is, as usual, divided into two sections; the spines of the first section are variable, there being sometimes one on each side, sometimes a row of two or three, sometimes a mere rudiment. Length of pupa 11·5 mm.

The fact that all these exuviae were projecting above the surface of the log by about three-quarters of their length confirms the opinion of Melin (1923 : 274) that, contrary to Perris's suggestion (1870 : 218), it is the pupa and not the imago which breaks through the plug closing the end of the larval gallery and emerges into the open. A similar observation on exuviae of a species of *Dasyllis* was recorded by Malloch (1917 : 383).

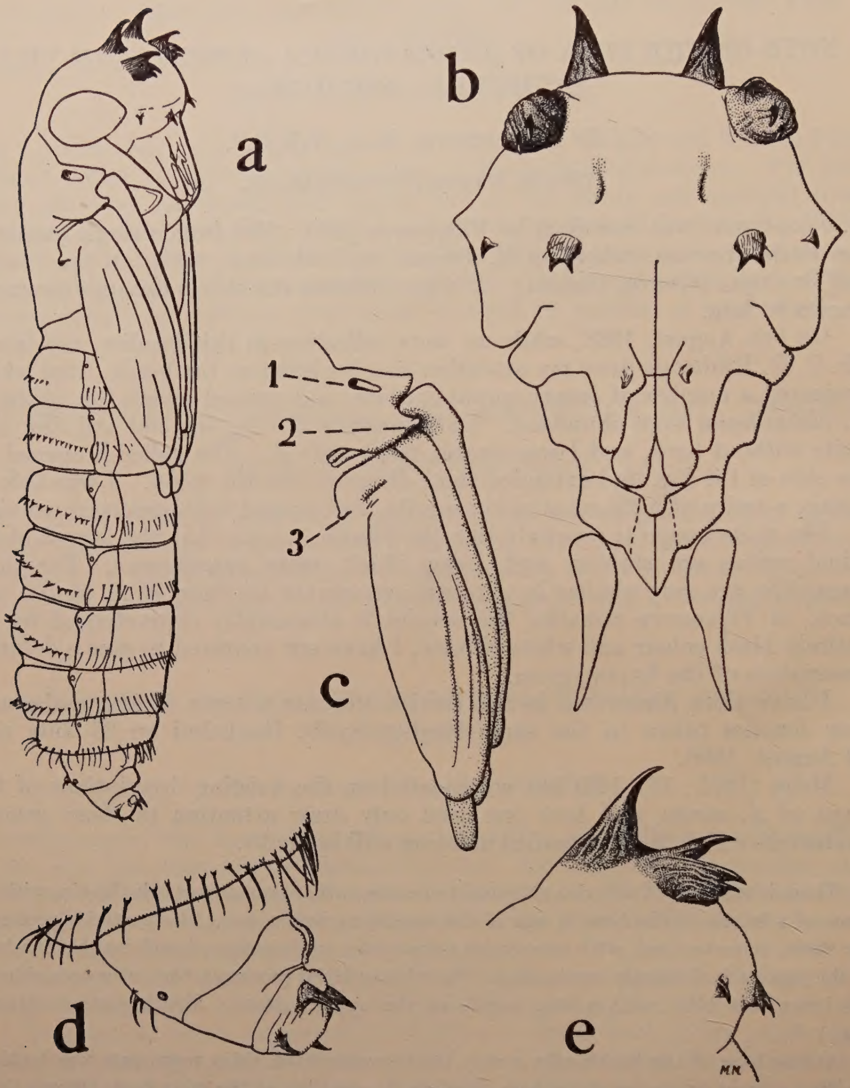

Fig. 1.—Pupa of *Andrenosoma albopilosum* Villn. (a) in side view; (b) ventral view of head and mouth-parts; (c) wing- and leg-sheaths, showing: 1. prothoracic spiracle, 2. sclerotised ridge, 3. toothed process at base of wing; (d) apex of abdomen; (e) processes of head.

## References.

Malloch, J. R., 1917, A preliminary classification of Diptera . . . based on larval and pupal characters . . ., *Bull. Illinois St. Lab. nat. Hist.* **12** : 161–410.

Melin, D., 1923, The Biology etc. of the Swedish Asilids, *Zool. Bidr. Uppsala* **8** : 1–317.

Perris, E., 1870, Histoire des insectes du pin maritime, *Ann. Soc. ent. Fr.* (4) **10** : 134–366, pls. 1–5.

Villeneuve, J., 1911, Description de deux Asilides nouveaux de Corse, *Bull. Mus. Hist. nat. Paris* **5** : 309–310.

# ON THE ZOOGEOGRAPHICAL CHARACTER OF THE COCCID FAUNA OF CENTRAL ASIA

By Prof. F. S. Bodenheimer, F.R.E.S.

*(Hebrew University, Jerusalem.)*

An extremely valuable contribution to the knowledge of the distribution of the Coccidae has recently been made by Mrs. A. D. Archangelskaya, in her book on the Coccidae of Central Asia. This volume is the more welcome, as it represents the first monograph on an entirely Irano-Turanian territory. The list of Coccidae has been taken from Mrs. Archangelskaya's paper. Their zoogeographical status has been thoroughly revised.

One hundred and thirteen species are determined definitely and a number of doubtful species are recorded. These species are distributed by subfamilies, as follows :

| Subfamily | Endemic species | Introduced species |
|---|---|---|
| Monophlebinae . . . | 1 | — |
| Ortheziinae . . . | 1 | 1 |
| Margarodinae . . . | 8 | — |
| Eriococcinae . . . | 25 | 4 |
| Lecaniinae . . . . | 12 | 8 |
| Asterolecaniinae . . | 2 | 1 |
| Diaspidinae . . . | 27 | 23 |
| Total . . . | 76 | 37 |

The prevalence of the subterraneous species of Margarodinae and Eriococcinae is a characteristic feature of this steppe region.

The zoogeographical analysis of this fauna must be restricted to the endemic species, the introduced species having no bearing on its zoogeographical character.

The list includes the following 37 species, their origin not being taken into consideration :

*Orthezia insignis* Dougl.
*Eriococcus buxi* Fonsc.
*E. cactearum* Leon.
*Pseudococcus adonidum* L.
*P. citri* Risso.
*Coccus hesperidum* L.
*Chrysomphalus dictyospermi* Morg.
*Aonidiella aurantii* Mask.
*Aulacaspis rosae* Bché.
*Diaspis bromeliae* Kern.
*D. boisduvali* Sign.
*D. echinocacti* Bché.
*Eulecanium arion* Ldgr.
*E. corni* L.
*E. persicae* F.
*Sphaerolecanium prunastri* Fonsc.
*Saissetia hemisphaerica* Targ.
*S. oleae* Bern.
*Pulvinaria floccifera* Westw.
? *Asterolecanium variolosum* Ratz.
*Aspidiotus camelliae* Sign.
*A. cyanophylli* Sign.
*A. hederae* Vall.
*A. lataniae* Sign.
*A. ostreaeformis* Curt.
*A. perniciosus* Comst.
*D. zamiae* Morg.
*Chionaspis evonymi* Comst.
*Mytilococcus beckii* Newm.
*M. juniperi* Ldgr.
*M. gloveri* Pack.
*Coccomytilus halli* Green.
*Pinnaspis aspidistrae* Sign.
*P. buxi* Bché.
*Parlatoria blanchardi* Targ.
*Gymnaspis aechmeae* Newst.
*Leucaspis gigas* Mask.

PROC. R. ENT. SOC. LOND. (A) 14. PT. 1. (JAN. 1939.)

The Irano-Turanian element is composed of many endemic forms, or species, occurring over the Irano-Turanian territories of Asia Anterior and South Russia. It is the dominant element in central Asia and is represented by the following forty-two species. The seven species not included in this group by Archangelskaya are marked by an asterisk. The reasons for their inclusion are given at the end of the list.

*Drosicha turkestanika* Arch.
*Margarodes arnebiae* Arch.
*M. cynodontis* Arch.
*M. nuda* Arch.
*M. odorata* Arch.
*M. sophorae* Arch.
*Neomargarodes chondrillae* Arch.
*Eriococcus turkmenicus* Arch.
*E. zygophylli* Arch.
*Phenacoccus arthrophyti* Arch.
* *P. ferrisi* Kir.
*P. latus* Kir.
*P. turanicus* Kir.
*P. zygophylli* Arch.
*Pseudococcus mendosus* Kir.
*Ripersia cynodontis* Kir.
*R. erianthi* Kir.
*R. halocharis* Kir.
* *Trabutina mannipara* Bdhr.
*Mediococcus circumscriptus* Kir.
*Aclerda turanica* Arch.
*Lecanium rugulosum* Arch.
*L. coryli turanicum* Arch.
*Sphaerolecanium unifasciatum* Arch.
*Pulvinaria orientalis* Nas.
* *P. pistaciae* Bdhr.
*Cerococcus longipilosus* Arch.
*C. perovskiae* Arch.
* *Aspidiotus alma-atensis* Borchs.
*A. leguminosum* Arch.
*A. prunorum* Laing.
*A. slavonica* Green.
*A. transcaspiensis* Marl.
* *Aonidia halli* Bdhr.
*Aonidiella arthrophyti* Arch.
*Chionaspis asiatica* Arch.
*Mytilococcus pistaciae* Arch.
*M. turanica* Arch.
* *Coccomytilus zlocistii* Bdhr.
* *Parlatoria ephedrae* Ldgr.
*Leucaspis archangelskyae* Ldgr.
*L. kermanensis* Ldgr.

*Phenacoccus ferrisi.* Odessa and Fergana.
*Trabutina mannipara.* In the Irano-Turanian enclave of the Sinai massiv and in Central Asia.
*Pulvinaria pistaciae.* A typical Irano-Turanian species, spread all over Central Asia, North Iran, Crimea, the Turanian territory of Inner Syria and penetrating into Upper Galilee.
*Aspidiotus alma-atensis.* Endemic in Kazakistan.
*Aonidia halli.* By mistake classified as Saharo-Sindian by me, as Mediterranean by Archangelskaya. It occurs in the southern massifs of Sinai, which is an Irano-Turanian enclave (Bodenheimer, 1936) and has now been found to be widely distributed in Turkmenistan.
*Coccomytilus zlocistii.* Discovered at Ben Shemen (Palestine), where it is rare and monophagous. Found in the Irano-Turanian enclave in Sinai and very polyphagous in Uzbekistan, Turkmenistan and Tajekistan in Central Asia, where it is obviously in its proper territory.
*Parlatoria ephedrae.* Known from Kerman (Iran), the Iranian area of Transjordan and Central Asia (Uzbekistan, Turkmenistan), penetrating into some eastern wadis of Egypt.

The Saharo-Sindian or desert element is composed of :

*Neomargarodes erythrocephala* Green.
*N. trabuti* March.
*Phenacoccus inermis* Hall.
? *P. zillae* Hall.
[1] *Ctenochiton haloxyloni* Hall.

---

[1] *Ctenochiton haloxyloni* is known from the deserts of Tunis, Egypt, S. Palestine and from the sand-dunes of Turkmenistan.

The following are common to the Saharo-Sindian, as well as the Irano-Turanian, region :

*Trabutina palestinae* Bdhr.
*Najacoccus serpentinus* Green.
*Aspidiotus artemisiae* Hall.

The first and third of these species are probably Irano-Turanian, penetrating only the desert.

The Mediterranean element is represented as follows :

*Antonina phragmites* March.
*Ceroputo superbus* Leon.
*Chionaspis striata* Newst.

The following species belong to the Mediterranean-Irano-Turanian group and seem to be equally at home in both regions :

*Pulvinaria artesmisiae* Licht.
*Parlatoria oleae* Colv.
*Adiscodiaspis tamaricicola* Mal.
*Chionaspis etrusca* Leon.
*Cryptaspidiotus mediterraneus* Ldgr.
*Aspidiotus ephedrarum* Ldgr.

A few, or all, of the species classified here as Mediterranean may prove to belong to this mixed group when more details are available on their distribution in Central Asia.

All those species which belong at least to three areas of the Holarctic region are called holarctic. They are widely distributed species which are at home in all those Holarctic areas and often are introduced elsewhere. They confirm the Holarctic character of the fauna, but are otherwise of little or no zoogeographical interest :

*Orthezia urticae* L.
*Eriococcus spurius* Mod.
? *E. insignis* Newst. (England, central Asia only)
*Eulecanium bituberculatum* Targ.
*Pulvinaria betulae* L.
*Eriopeltis festucae* Fonsc.
*Diaspis visci* Schr.
*Chionaspis salicis* L.
? *Mytilococcus intermittens* Hall (Algeria, Egypt, Jordan Valley, Samerkand).
*M. ulmi* L.

The species *Luzulaspis luzulae* Duf. has been found once. It is probably a Euro–Siberian irradiation.

Another group occurs on *hydrophilous* habitats, mainly on Phragmites and other reeds :

*Pseudococcus variabilis* Hall.
*Ripersia phragmites* Hall.
*R. cellulosea* Hall.
*Chionaspis graminis* Green.
*C. herbae* Green.

Part of these are known only from Egypt and Palestine, others from Ceylon, or from both regions. They are most probably old tertiary relicts of an element now mainly represented in the Palaeotropical region. *Phenacoccus latipes* Green is also regarded by Archangelskaya as belonging to this group. The inclusion of the three first-mentioned species is somewhat doubtful, as they are not yet known from any part of the Palaeotropical region, but it seems absurd to include them in the desert element.

The distribution of the different zoogeographical elements is as follows :

| | |
|---|---|
| Cultural immigrants | 37 species |
| Irano-Turanian | 42 |
| Saharo-Sindian | 5 |
| Irano-Turanian | 3 |
| Mediterranean | 3 |
| Mediterranean-Irano-Sindian | 6 |
| Holarctic | 10 |
| Euro-Siberian | 1 |
| Palaeotropical relations | 6 |
| Total | 113 |

The zoogeographical spectrum of the Coccidae of central Asia is therefore :

| | No. of species | % | % (after exclusion of the non-characteristic Holarctic element of wide distribution) |
|---|---|---|---|
| Irano-Turanian | 46·5 | 61·2 | 70·5 |
| Saharo-Sindian | 6·5 | 8·5 | 9·9 |
| Mediterranean | 6·0 | 7·9 | 9·1 |
| Euro-Siberian | 1·0 | 1·3 | 1·5 |
| Holarctic species of wide distribution | 10·0 | 13·3 | — |
| Palaeotropical relations | 6·0 | 7·9 | 9·1 |
| Total | 76·0 | 100·1 | 100·1 |

The Irano-Turanian character of this fauna is thus much more dominant than shown by the analysis of Archangelskaya. The scarcity of information available and the lack of intimacy with the zoogeographical territories of upper Asia are the reasons for these divergencies, which do not diminish in any way the value and importance of the work of the author quoted.

## References.

Archangelskaya, A. D., 1937, *The Coccidae of Middle Asia.* Tashkent (in Russian).

Bodenheimer, F. S., 1936, The Zoogeography of the Sinai Peninsula. *C.R. XII. Congr. Int. Zool. Lisbonne* : 1138–1164.

# NOTES ON A BROOD OF *CALLIMORPHA DOMINULA* (L.) AB. *MEDIONIGRA* COCKAYNE (LEPIDOPT., ARCTIIDAE)

By Edward W. Aubrook

(*Assistant, Hope Dept. of Entomology, University Museum, Oxford.*)

Communicated by Dr. B. M. Hobby, F.R.E.S.

Mr. W. F. Burrows brought to the Oxford University Museum on 2nd August, 1937, a female *Callimorpha dominula* (L.) ab. *bimacula* Cockayne (1928 : 154–5), which he had captured at Cothill, Berkshire, and from which I obtained about thirty eggs. The resulting larvae were supplied with nettle until November, when they were placed in a cold room in order that they might hibernate amongst the dead leaves in the breeding-vessel. In February they were brought back into the laboratory, whereupon they resumed feeding, and pupated during March and April. Some mortality occurred during the early instars, but seventeen larvae hibernated successfully. Thirteen of these pupated and ten moths—three males and seven females—emerged between 20th April and 23rd May, 1938. These were all of the aberration *medionigra* Cockayne.

In the female parent the spots at the apical angle of the fore-wing are represented by tiny dots, and so is the subapical blotch; the usual double spot near the inner angle is indicated by one small dot. The black band running across the centre of the hind-wing is a little narrower than in the extreme form.

In the offspring the fore-wings resemble those of moths figured by Cockayne (*loc. cit.*, pl. vi, fig. 2, and pl. vii, fig. 7), some variation occurring in the shape of the subapical blotch. The extra central spot of the hind-wing is in some cases isolated and in others joined to the black markings anterior and posterior to it to form a wavy black band across the wing. Two females and a male died in the pupal stage. In the former, pupal development had proceeded sufficiently for the undeveloped wings to be extracted and their pattern noted. In one case the wings resembled those of the other members of the brood, and the central bands of the hind-wings were complete. The second example presented certain differences which are here described in detail.

In the right fore-wing the outer spots are like those of the rest of the offspring. The central spot is small; the outlines of normal-sized basal spots can be traced, but the scales, with the exception of a small area in each spot, are greyish instead of yellow. In the left fore-wing the apical spots and the double spot near the inner angle are absent; the subapical blotch is suffused with greyish scales; the central spot is absent; the anterior basal spot is normal, but the posterior is greyish and its outlines not clearly defined. In the right hind-wing there is a broad black band centrally; in addition there is a narrow black band slightly nearer the base and parallel to this, apparently converging with it towards the anal angle. The left hind-wing is similar except that the extra black band terminates before the centre of the wing. The spot which gives rise to this " extra black band " is present in most examples of ab. *medionigra*, although it may not be noticeable as it may be covered by the posterior margin of the fore-wing. It has no separate existence in extreme examples of ab. *bimacula*, being joined with the widened central band.

Unfortunately, no pairing was seen to take place between members of the brood, and eggs laid by females were infertile and ultimately collapsed.

The fact that all the offspring of the mating *dominula* × *bimacula* are of the *medionigra* form is in accord with Dr. Cockayne's suggestion that the latter is the heterozygote between the two. Since twelve individuals could be identified, the chances are very small that either of the presumed homozygotes were prevented from appearing merely as the result of a coupling error obscuring a simple ratio.

The twelve *medionigra* show a considerable range of variation, part—and probably a large part—of which may reasonably be assumed to be genetic; especially since the common homozygote (*dominula*) is normally much less variable than this sample of *medionigra* proves to be. This suggests an interesting opportunity for future work. A selection experiment might, with advantage, be conducted on the heterozygotes: pairs with the least black (the more normal) and with the most black (the less normal) being mated together respectively for several generations. Provided that the variation is partly genetic as suggested, two lines would thus be obtained, the one in which the heterozygotes would approach *dominula*, and the other in which they would approach *bimacula*. That is to say, such a procedure might operate so as, on the one hand to reduce, and on the other to magnify the effects of the *bimacula* gene in single dose. In other words, it might tend to make the effects of the same gene approach recessiveness in the one line and dominance in the other, so providing an example of dominance-modification by selection.

On 5th August, 1937, Mr. Burrows captured a male of the ab. *medionigra* at Cothill, and male examples of the ab. *bimacula* were also collected by Mr. J. Collins on 9th July, 1933, and by Mr. Burrows on 2nd August, 1936.

I wish to thank Professor G. D. Hale Carpenter for permission to publish the above records of specimens in the University Collection; to acknowledge my indebtedness to Mr. E. B. Ford for kind assistance with the genetical notes; and to thank Mr. Burrows for providing the parent *bimacula*.

## REFERENCES.

Cockayne, E. A., 1928, Variation in *Callimorpha dominula* L., *Ent. Rec.* **40** : 153–160.
Ford, E. B., 1937, Problems of heredity in the Lepidoptera, *Biol. Rev.* **12** : 461–503.

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# *DERMESTES AURICHALCEUS* KÜST. FROM THE LARVAL NEST OF *THAUMETOPOEA PITYOCAMPA* (SCHIFF.)

By I. H. H. Yarrow, M.A., Ph.D., D.I.C., F.R.E.S.

A nest of the Processionary Caterpillar, *Thaumetopoea pityocampa* (Schiff.) was sent from Grenoble in March 1938. All the larvae had left the nest, but there were obvious signs that it contained a number of Dermestid larvae. These lived somewhere in the middle of the nest, but came out into the silken walls to moult. Pupation took place out of sight within the nest, and five adult beetles emerged during the following September. These have been identified as *Dermestes aurichalceus* Küst. The moulted head capsules of the Lepidopterous larvae recovered from this nest can be divided into two distinct size-groups, indicating that either a proportion of the larvae in the community had developed more slowly than the others, or, what seems more probable, that one complete instar and a part of the preceding and succeeding instars were passed in the nest.

# THE ACULEATE HYMENOPTERA OF A SMALL ISOLATED SAND PATCH IN DORSET

By I. H. H. Yarrow, M.A., Ph.D., D.I.C., F.R.E.S.

During the second fortnight of August and the first week of September 1937, a careful examination was made of the Aculeate fauna of a small isolated sand patch at Lytchett Minster in Dorset. This patch was surrounded by heather and contained in the middle an old tree stump. The total area of the patch was about twenty-eight square feet, but the area of available sand was only about twenty square feet. The insect fauna was almost entirely limited to the Hymenoptera and the number of insects that could be seen burrowing in the sand at the same time was remarkable. On one occasion the Bombylid *Thyridanthrax fenestratus* (Fall.) was observed following *Ammophila sabulosa* (L.) (cf. Yarrow, 1937, *Ent. mon. Mag.* **73**: 18), and *Bombylius minor* L. was taken on several occasions settled on the sand.

The following list of Aculeates taken on this patch is more interesting for its variety in relation to the area of the habitat than for the insects which constitute it.

### Chrysididae.

*Hedychridium roseum* (Rossi). Associated with *Astata boops* (Schr.).

### Myrmosidae.

*Myrmosa atra* Panz. More numerous than *S. rufipes*, occasionally taken on tree stump.

### Mutillidae.

*Mutilla europaea* L. Small ♀ crossed patch, 19.viii.
*Smicromyrme rufipes* (Fab.). Several ♀♀ taken running on sand.

### Formicidae.

*Myrmica sulcinodis* Nyl. Occasional individuals taken.
*M. scabrinodis* Nyl. Occasional individuals taken.
*M. ruginodis* Nyl. Occasional individuals taken.
*Lasius niger* (L.). Large colony on margin.
*L. flavus* (Fab.). Nest in sand beneath tree stump.
*L. umbratus* (Nyl.). Colony among roots of tree stump.
*Formica rufa* L. Small nest about 500 yards from patch.
*F. fusca* L. Two colonies on margin of patch.

### Pompilidae.

*Cryptocheilus affinis* (V. d. Lind.). One ♀ taken running on sand.
*Pompilus plumbeus* Fab. Common, hunting spiders.
*Evagetes dubius* (V. d. Lind.). One ♀ taken on margin of patch.
*Episyron rufipes* (L.). Common.

### Sphecidae.

*Astata boops* (Schr.). Numerous ♀♀ burrowing in sand.
*Ammophila sabulosa* (L.). Often observed burying Lepidopterous larvae.
*A. campestris* Latr. One individual seen.
*Podalonia viatica* (L.). One individual taken, but species common in district.
*Mimesa equestris* (Fab.). One specimen taken burrowing in sand.
*M. unicolor* (V. d. Lind.). Nesting in tree stump.

*Oxybelus uniglumis* (L.). Not often observed.
*Ablepharipus podagricus* (V. d. Lind.). Taken on tree stump.
*Hoplocrabro quadrimaculatus* (Fab.). Nesting in tree stump.
*Mellinus arvensis* (L.). A large colony nesting in the vertical wall formed by a rabbit scratching.
*Cerceris rybyensis* (L.). One ♀ taken on tree stump.
*C. arenaria* (L.). Flew from heather on to tree stump.

### APIDAE.

*Colletes succincta* (L.). ♀♀ common burrowing in the sand.
*C. fodiens* (Geoff. *in* Fourc.). Not so common as *C. succincta,* but both species common in district.
*Prosopis communis* (Nyl.). Taken on tree stump.
*Sphecodes reticulatus* Thoms. One ♂ taken on tree stump.
*Sphecodes* spp. indet.
*Andrena fuscipes* (Kirb.). ♂♂ and ♀♀ common in heather and often taken on the patch.
*Panurgus calcaratus* (Scop.). One ♂ taken on tree stump.
*P. banksianus* (Kirb.). ♀♀ common burrowing in sand.
*Epeolus cruciger* (Panz.). Associated with *Colletes* spp.
*Anthophora bimaculata* (Panz.). One of the most numerous insects on the patch.
*Nomada rufipes* Fab. Associated with *Andrena fuscipes* and very numerous in the district.

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## BOOK NOTICE.

La Biologie des Orthoptères. By L. CHOPARD. 8vo. Paris (Lechevalier). (*Encyclopédie Entomologique* (A) **20.**) pp. 541, 5 pls., 453 figs.

This volume is one of the monographs published as series A of the *Encyclopédie Entomologique* and in it Orthoptera is understood to include Dermaptera.

Chapters are given on: geographical distribution of Orthoptera; the various habitats of Orthoptera; Orthoptera which construct a shelter; reproduction; development and activities in Orthoptera; the production of sound; homoeosis and regeneration; reflex actions and means of defence; reactions of Orthoptera to external factors; homochromism and mimicry; variation and heredity; rudiments of social life in Orthoptera.

The book is completed by a systematic index, a list of the hosts of commensal and parasitic Orthoptera and a list of the names of authors cited. A series of bibliographies is given, one or more to each chapter.

Attention is drawn by the author to the small amount of published information on the many tropical forms of Orthoptera. A great attempt has been made to gather in this book what is at present known of the biology of the whole order.

## BOOK NOTICE.

*Festschrift zum* 60 *Geburtstage von Prof. Dr. Embrik Strand.* Vol. 3. 8vo. Riga. pp. 608, 20 pls., 187 figs.

This is the third volume of a work, of which volumes 1 and 2 have already been noticed in this journal.

It comprises 44 papers, of which 18 deal with entomological subjects and others are of general and therefore entomological interest.

A fourth and final volume is announced as in the press, and it is stated that it will include a complete index to all the four volumes.

# OBSERVATIONS ON *ASILUS CRABRONIFORMIS* (L.) (DIPTERA)

By I. H. H. Yarrow, M.A., Ph.D., D.I.C., F.R.E.S.

Two females of this insect were observed hunting in some waste land near Culford, Suffolk, on 12th August, 1938. Both insects had taken a position about two feet away from the remains of a rat which was surrounded by numerous flies. From time to time one of these flies would pass within range of an Asilid, which at once darted out and attacked it. After a few vain attempts one of the Asilids disappeared. The remaining insect was kept under observation for about one hour, during which time it made nineteen attempts upon passing insects. Each attack was carried out with great rapidity, the Asilid settling down immediately afterwards. The original position from which attacks were made consisted of (A) a flat piece of bark. From here the insect moved to an open piece of ground about two feet away (B), then to the side of a stick (C) and finally back to the original position (A). An analysis of its movements is given below :—

| | |
|---|---|
| No. of consecutive attempts on flying insects after which it returned to position A. | 7 |
| No. of consecutive returns to position B. | 2 |
| No. of consecutive returns to position C. | 4 |
| No. of consecutive returns to the original position A. | 3 |
| Total number of fruitless attempts. | 18 |
| Greatest length of time during which the Asilid remained motionless. | approx. 13 mins. |

The insects on which these attacks were made consisted, in the main, of *Lucilia* spp. flying round the remains of the rat. As far as could be seen the insects attacked and the number of attacks were as follows :—

| | |
|---|---|
| *Lucilia* spp. (Diptera) | 9 |
| *Mesembrina meridiana* (L.) (Diptera) | 1 |
| *Philonthus aeneus* (Rossi) (Coleopt. Staphylinidae) | 1 |
| Unknown | 8 |

The Asilid succeeded in securing the *Philonthus* and landed with it about thirty yards away, where it was eventually caught in the net.

A Staphylinid beetle as the prey of an Asilid has been recorded in Sweden by Melin (1923, *Zool. Bidrag.* **8**), where *A. crabroniformis* took *Philonthus splendens* (Fab.), and in England by Parmenter (1936, *Lond. Nat.* **1936 :** 51), where *A. crabroniformis* took *Philonthus aeneus*.

# A FURTHER NOTE ON *PSEUDACRAEA EURYTUS* (L.) (LEPID. NYMPHALINAE) AND ITS MODELS IN EASTERN UGANDA

By G. D. Hale Carpenter, D.M., F.R.E.S.

(*Hope Professor of Zoology* (*Entomology*) *in the University of Oxford.*)

In 1924 (*Trans. ent. Soc. Lond.* **1923** : 469–91, pls. xxvi and xxvii) an account is given of the relationships between this polymorphic mimic and its models in the Eastern Province of Uganda, wherein I showed that the orange and white *Bematistes poggei nelsoni* (Gr.-Sm.) is the chief model for *Ps. eurytus* in that locality, in which *Bematistes macarista* (E. M. Sharpe) with its black and white female, and other species with closely similar females, have not been found.

Attention was also drawn to the importance of *Bematistes aganice montana* (Btlr.) in the eastern part of Uganda.

A few specimens recently received from Mr. T. H. E. Jackson, F.R.E.S., from Busia in the same locality, have most interestingly confirmed the former data.

Among a small collection were the following :

*Bematistes poggei nelsoni*, 2 ♂♂, Busia, November 1937.
*Bematistes aganice montana*, 1 ♂, Busia, November 1937.
*Pseudacraea eurytus opisthoxantha* Carptr., 1 ♂, Busia, November 1937.

Two other specimens sent from three miles west of Busia in November 1933 by Mr. Jackson may also be mentioned : *Pseudacraea eurytus hobleyi* Neave, 1 ♂, and a remarkable form of *Bematistes epaea paragea* (Gr.-Sm.), ♀, with the pale areas faintly yellowish-white and, on the hind-wing, occupying the greater part. I cannot recall any previous record for this species so far to the east (*loc. cit.*, map p. 471), though it occurs at Jinja.

The likeness of the coloration of *B. eurytus opisthoxantha* to ♂ *B. aganice montana* is remarkable, and it seems probable that this form depends upon the latter as its model.

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## BOOK NOTICE.

*Varieties of British Butterflies.* A selection of rare and interesting specimens of Aberrations, including Gynandromorphic and Homoeotic forms, Albinism and Melanism. By F. W. Frohawk. 8vo. London (Ward Lock). 1938. pp. 200, 48 pls. col. Price £2 2*s.* 0*d.*

The scope of this book is clearly indicated by its title. It consists of 200 pages (the 48 coloured plates are included in the pagination), on which are given the coloured illustrations of " the most interesting and important specimens of Aberrations, Seasonal and Local Races, and Dimorphic Sexual Forms of [fifty-one of the] sixty-eight British Species," and a short description of the specimens figured. Details of the locality where taken, and the collection in which the specimen is now to be found, are given for all the specimens figured. The original drawings for the plates are now in the British Museum (Natural History). A misprint occurs on p. 27 in " *Danaus plexsippus* ".

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Smith, A., 1936, New species of Coccidae, *Proc. R. ent. Soc. Lond.* (B) **6** : 301–306, pl. 1.

——. 1936, New species of Coccidae, *Trans. R. ent. Soc. Lond.* **84** : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals, 2nd edition*, 1934.

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1939.

Wednesday, January 18 8.0 p.m. (Annual Meeting)
„ February 1 6.0 p.m.
„ March 1 8.0 p.m.
„ „ 15 6.0 p.m.

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